

AMENDMENTS TO THE CLAIMS

1. (Currently amended) A method for ignoring ground clutter in determining the presence of a missile seeker that retro-reflects incident light, comprising the steps of:

projecting an ultrashort laser pulse having a predetermined nanosecond pulse length width towards a search area to illuminate the retro-reflector of a seeker;

detecting only returns from the search area having the same pulse width as the projected pulses so as to detect retro-reflective returns from the seeker and so as to reject pulse-stretched returns, the detecting step including using with a focal plane array having a direct-reading focal plane array of photo detectors, each of the photo detectors having a threshold circuit coupled to the output thereof and set high enough to ignore ~~the~~ low-level non-retro-reflected returns from the terrain illuminated by the laser; directly and simultaneously reading out each of the photo detectors for direct event detection of retro-reflected energy characterized by pulse widths virtually identical to the pulse width of the projected pulses, the readout being in a time short enough to obtain a reading from each of the photo detectors before the arrival of the next pulsed return, the time defining a frame; and without post-processing, determining from the readout that there is a retro-reflected return from a missile seeker and the position thereof if there is a signal from a single threshold circuit during the frame and if the signal from the single threshold circuit is not longer than the ~~predetermined nanosecond pulse length, whereby the threshold level limits returns whose amplitude is not indicative of a seeker~~ pulse width of the projected ultrashort pulse such that pulse width thresholding selects retro-reflected returns; and ~~whereby ignores~~ elongated returns from the illuminated terrain are ignored.

2. (Canceled)

3. (Previously amended) The method of Claim 1, wherein the determining step includes providing a NAND gate having one input thereto coupled to the output of the threshold circuit and the other input thereto coupled to a delayed version of the output of the threshold circuit.

4. (Canceled)

5. (Previously amended) The method of Claim 1, wherein compact targets are discriminated from ground returns by ascertaining if during a frame there are only a small predetermined number of outputs from the threshold circuit.

6. (Cancel)

7. (Currently amended) A detector element in a focal plane array used in a laser range finder or LIDAR system that projects a pulse towards a retro-reflecting target, the pulse having a predetermined nanosecond pulse-length width, said detector element responding only to retro-reflected energy in which the retro-reflected return pulse width is substantially equal to the width of the projected pulse, and ignoring thus to ignore ground clutter returns, comprising:

a photo detector;

a threshold circuit coupled to said photo detector; and,

a filter coupled to said threshold circuit for ignoring an output from said photo detector exceeding ~~said~~ the predetermined nanosecond pulse ~~length~~ width of the projected pulse, thereby to selectively detect only returns from said retro-reflecting target.

8. (Currently amended) The detector element of Claim 7, wherein said filter includes an RC circuit set to filter out outputs from said threshold circuit that persist longer than said predetermined nanosecond pulse ~~length~~ width time duration.

9. (Canceled)

10. (Original) The detector element of Claim 7, wherein said filter includes a NAND gate having one input thereto coupled to the output of said threshold circuit and a delay circuit coupled between the output of said threshold circuit and the other of the inputs to said NAND gate.

11. (Original) The detector element of Claim 10, wherein said delay circuit delays the output of said threshold detector in the nanosecond range.

12. (Currently amended) A focal plane array architecture for use with a pulsed laser generating pulses having a predetermined nanosecond pulse-lengths width to detect only retro-reflected returns from a missile seeker, comprising:

a photon detector and a threshold circuit for each pixel of said array for increasing the feasibility of photon counting at infrared wavelengths;

an ultra fast frame readout for said array utilizing direct simultaneous pixel readout;

means coupled to said frame readout for inherent discrimination of ~~compact~~ retro-reflecting targets by ignoring ground returns, said inherent discrimination means including a filter for ignoring returns that persist beyond ~~said the~~ predetermined nanosecond pulse-length width of the pulses from said laser; and,

means coupled to said means for inherent discrimination for programmable range gating.